SLOVENSKI STANDARD
SIST EN 12859:2008

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SIST EN 12859:2002
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Mavļ ni bloki - Definicije, zahteve in preskusne metode

Gypsum blocks - Definitions, requirements and test methods

Gips-Wandbauplatten - Begriffe, Anforderungen und Prüfverfahren

Carreaux de plâtre - Définitions, spécifications et méthodes d'essai

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EUROPEAN STANDARD

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English Version

Gypsum blocks - Definitions, requirements and test methods

Carreaux de plâtre - Définitions, spécifications et méthodes d'essai

Gips-Wandbauplatten - Begriffe, Anforderungen und Prüfverfahren

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CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 12859:2008) has been prepared by Technical Committee CEN/TC 241 “Gypsum and gypsum based products”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12859:2001.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 89/106/EC.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard includes:

— normative annex concerning sampling for independent test;

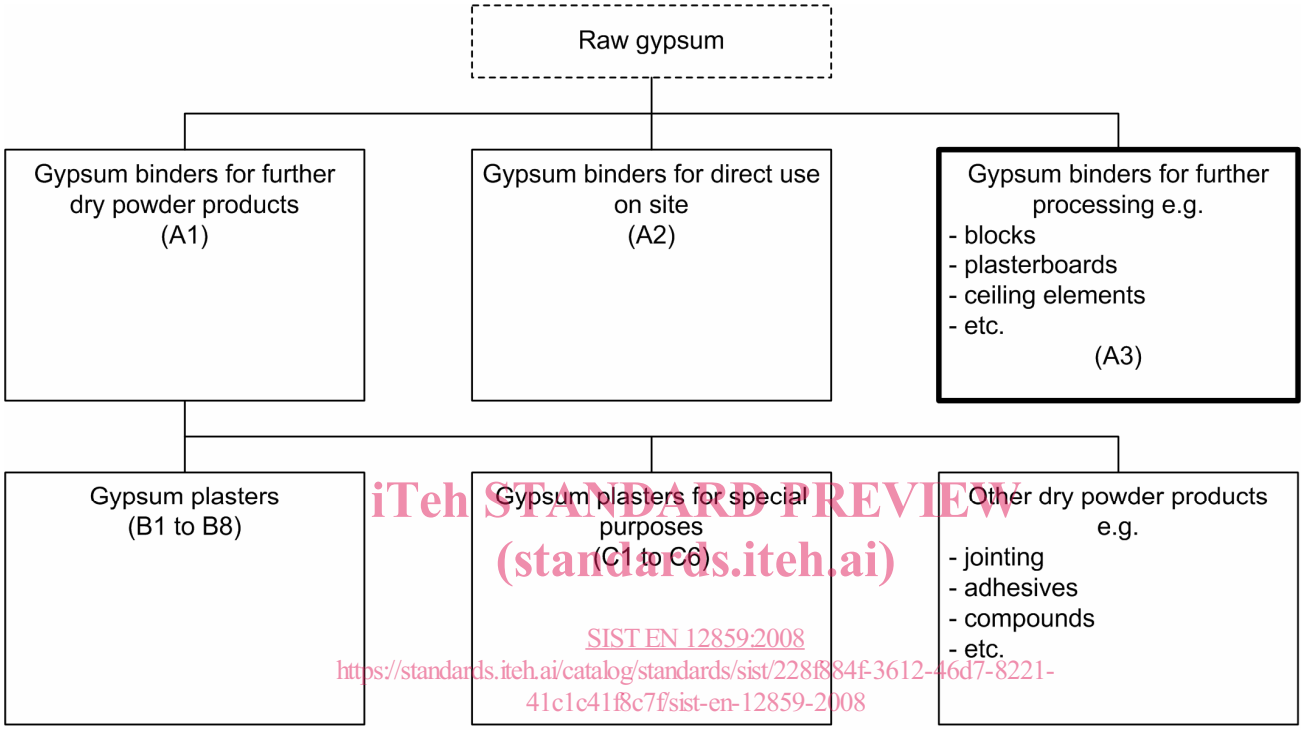
— informative annex recommending requirements and test method for measuring surface hardness;

— informative annex for a visual identification by coloration of gypsum blocks.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Diagram 1 shows the relationship between this standard and the package of standards prepared to support the family of gypsum products.



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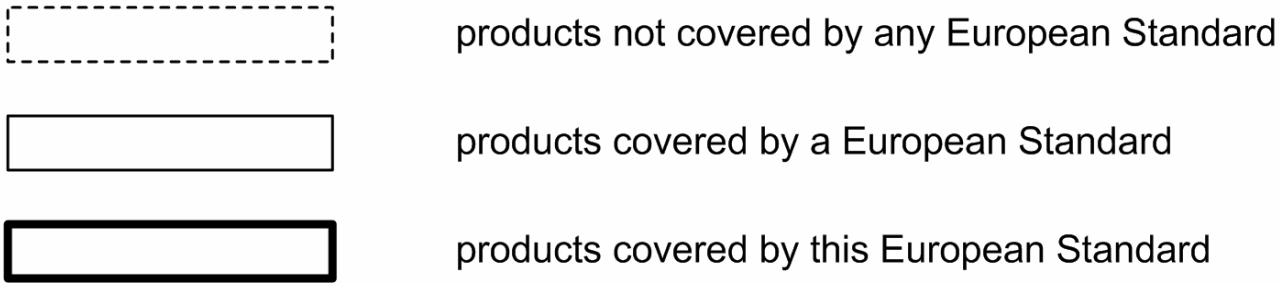


Diagram 1 — Family of gypsum binders and gypsum products

1 Scope

This European Standard specifies the characteristics and performance of gypsum blocks with smooth faces for which the main intended uses are construction of non-load bearing partitions or independent wall linings and the fire protection of columns, lift shafts, etc. The gypsum blocks are not used to build ceilings.

It covers the following performance characteristics related to the essential requirements:

— reaction to fire;

— resistance to fire;

— direct airborne sound insulation;

— release of dangerous substances;

to be measured according to the corresponding European test methods, as well as:

— thermal resistance,

to be calculated from the thermal conductivity values given in 4.3.2.

It describes the reference tests for technical specifications.

This European Standard also covers additional technical characteristics that are of importance for the use and acceptance of the product by the construction industry:

— convenience class for density;

— convenience class for pH;

— surface hardness.

It provides for the evaluation of conformity of the product to this European Standard.

This European Standard does not cover gypsum blocks of thickness less than 50 mm or gypsum storey height units.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13501-1, *Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests*

EN 13501-2, *Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN ISO 140-3, *Acoustics – Measurement of sound insulation in buildings and of building elements – Part 3: Laboratory measurements of airborne sound insulation of building elements (ISO 140-3:1995)*

EN ISO 717-1, *Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation*

EN ISO 6946, *Building components and building elements – Thermal resistance and thermal transmittance – Calculation method (ISO 6946:2007)*

EN ISO 10456, *Building materials and products – Hygrothermal properties – Tabulated design values and procedures for determining declared and design thermal values (ISO 10456:2007)*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
gypsum block
factory made building element produced from calcium sulphate and water that may incorporate fibres, fillers, aggregates and other additives as long as they are not classified as dangerous substances in accordance with European regulations

NOTE 1 The gypsum block is a rectangular parallel piped, with tongues and grooves on at least two of their opposite edges.

NOTE 2 It may be coloured by pigmentation

3.1.2
solid gypsum block
gypsum block manufactured without cavities

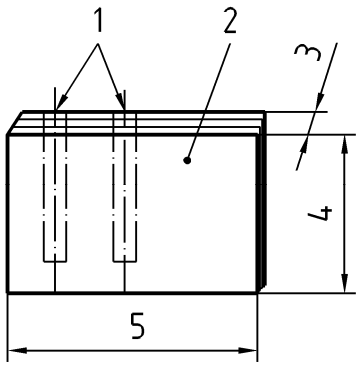
3.1.3
cavity gypsum block
gypsum block which incorporates preformed cavities

3.1.4
preformed cavity
formed cavity parallel to the faces which may or may not pass completely through the block. It may run parallel with the height or the length (see Figure 1)

3.1.5
face
plain and smooth surface intended to provide the finish of a partition (see Figure 1)

3.1.6
edge
extreme side of the gypsum block having tongues and grooves (see Figure 1)

3.1.7
thickness
distance between the two faces of a gypsum block (see Figure 1)



Key

1 Preformed cavities
2 Face
3 Thickness
4 Height
5 Length

Figure 1 — Gypsum block

3.2 Symbols

For the purposes of this European Standard, the following symbols apply.

ρ	gross dry density, in kilograms per cubic metre (kg/m^3);
λ	thermal conductivity, in Watts per metre per Kelvin (W/m·K);
$\lambda_{23\text{-}50}$	thermal conductivity of the hardened plaster when in equilibrium at 23 °C and 50 % relative humidity, in Watts per metre per Kelvin (W/m·K);
M	mass of the gypsum block in kilograms (kg).

4 Requirements

4.1 Fire behaviour

4.1.1 Reaction to fire

Gypsum blocks are classified in Euroclass A.1 (no contribution to fire) without testing when they contain less than 1 % by weight or volume (whichever is the more onerous) of organic material.

If they contain 1 % or more, by weight or volume of organic material, they shall be determined and classified in accordance with EN 13501-1.

4.1.2 Fire resistance

Resistance to fire is a property of an assembled system and not of the product itself.

When relevant, the fire resistance of a system including gypsum blocks assembled with adhesive for gypsum blocks shall be determined and classified in accordance with EN 13501-2.

4.2 Direct airborne sound insulation

Direct airborne sound insulation is a property of an assembled system and not of the product itself.

When relevant, the direct airborne sound insulation of a system including gypsum block assembled with adhesive for gypsum blocks shall be determined in accordance with EN ISO 140-3 and EN 717-1.

4.3 Thermal properties

4.3.1 Thermal resistance

When the intended use of gypsum blocks is to contribute to thermal resistance in building construction works, the thermal resistance is calculated using the formula given in EN ISO 6946.

The values of thermal conductivity necessary for this calculation are given in 4.3.2 and thickness values to be used shall be measured according to 5.3.1.

4.3.2 Thermal conductivity

Design values of the thermal conductivity of hardened gypsum plaster used in the manufacture of gypsum blocks are given in Table 1.

Table 1 — Design values of thermal conductivity of gypsum plaster

ρ kg/m^3	$\lambda_{23\text{-}50}$ W/(m.K)
600	0,18
700	0,22
800	0,26
900	0,30
1 000	0,34
1 100	0,39
1 200	0,43
1 300	0,47
1 400	0,51
1 500	0,56

The values given in Table 1 are taken from EN 12524. Design values concern dry material used inside. When the material is wet, adjust these values using EN ISO 10456.

4.4 Types of gypsum blocks

4.4.1 Visual identification by coloration of gypsum blocks

The visual identification by coloration between the different types of gypsum blocks is based on the following two criteria:

— water absorption;

— density.

Table 2 – Water absorption class

Colour	Water absorption	Label
Natural	Without requirement	H3 [a]
Blue	≤ 5%	H2
Green	≤ 2,5%	H1
[a] The visual identification by colour of the density class is only applied on class H 3 (water absorption class).		

Table 3 – Density class

Colour	Density class
Pink [a]	High density
Natural	Medium density
Yellow [a]	Low density
[a] The visual identification by colour of the density class is only applied on class H 3 (water absorption class).	

4.4.2 Gypsum blocks are manufactured in three types of density (see 4.8). Some blocks can be hydrophobic (see 4.13).

4.5 Release of dangerous substances

NOTE For CE marking purposes, see Annex ZA.1 NOTE 1 and NOTE 2.

4.6 Dimensions and tolerances

4.6.1 Dimensions

Gypsum block dimensions are determined by the thickness, the length and the height.

The thickness shall be at least 50 mm and shall not exceed 150 mm.

The length shall not exceed 1 000 mm.

The height shall be determined in conjunction with the length so that the surface area of a block is at least 0,20 m^2.

NOTE Preferred dimensions are for thickness : 50 mm, 60 mm, 70 mm, 80 mm, 100 mm, for length : 666 mm and for height : 500 mm.

In cavity gypsum blocks, the wall gypsum plaster shall be at least 15 mm thick throughout the block. The total cavity volume shall not exceed 40 %.

4.6.2 Tolerances

The dimensions of individual blocks, when measured in accordance with 5.3, shall have tolerances as follows:

— thickness: ± 0,5 mm;

— length: ± 5 mm;

— height: ± 2 mm.

4.7 Flatness of gypsum blocks

The flatness of individual blocks when measured in accordance with 5.4, shall have a deviation not greater than 1 mm.

4.8 Dry density and tolerance: classes of density

The gross dry density of the hardened gypsum of the solid part of the block, which is the mean gross density of the specified number of samples in accordance with 5.1 and measured in accordance with 5.6, shall be as follows:

— High density

$1\,100 \leq \rho \leq 1\,500$ kg/m^3

— Medium density

$800 \leq \rho < 1\,100$ kg/m^3

— Low density

$600 \leq \rho < 800$ kg/m^3

— Tolerance

The average gross dry density within each class shall not deviate by more than 5 % from the average value measured in accordance with 5.6.

4.9 Surface mass of gypsum blocks and tolerance

The producer declares the surface mass (mass per square metre) of his gypsum blocks.

When the mass of gypsum blocks is determined in accordance with 5.5 and their surface calculated in accordance with 5.3.2 and 5.3.3, the average surface mass of gypsum blocks shall not deviate by more than 5 % from the declared surface mass.

4.10 Bending strength

Gypsum blocks shall have a bending strength appropriate to their use, and for this, when tested in accordance with 5.7, they shall withstand the load given in Table 2.